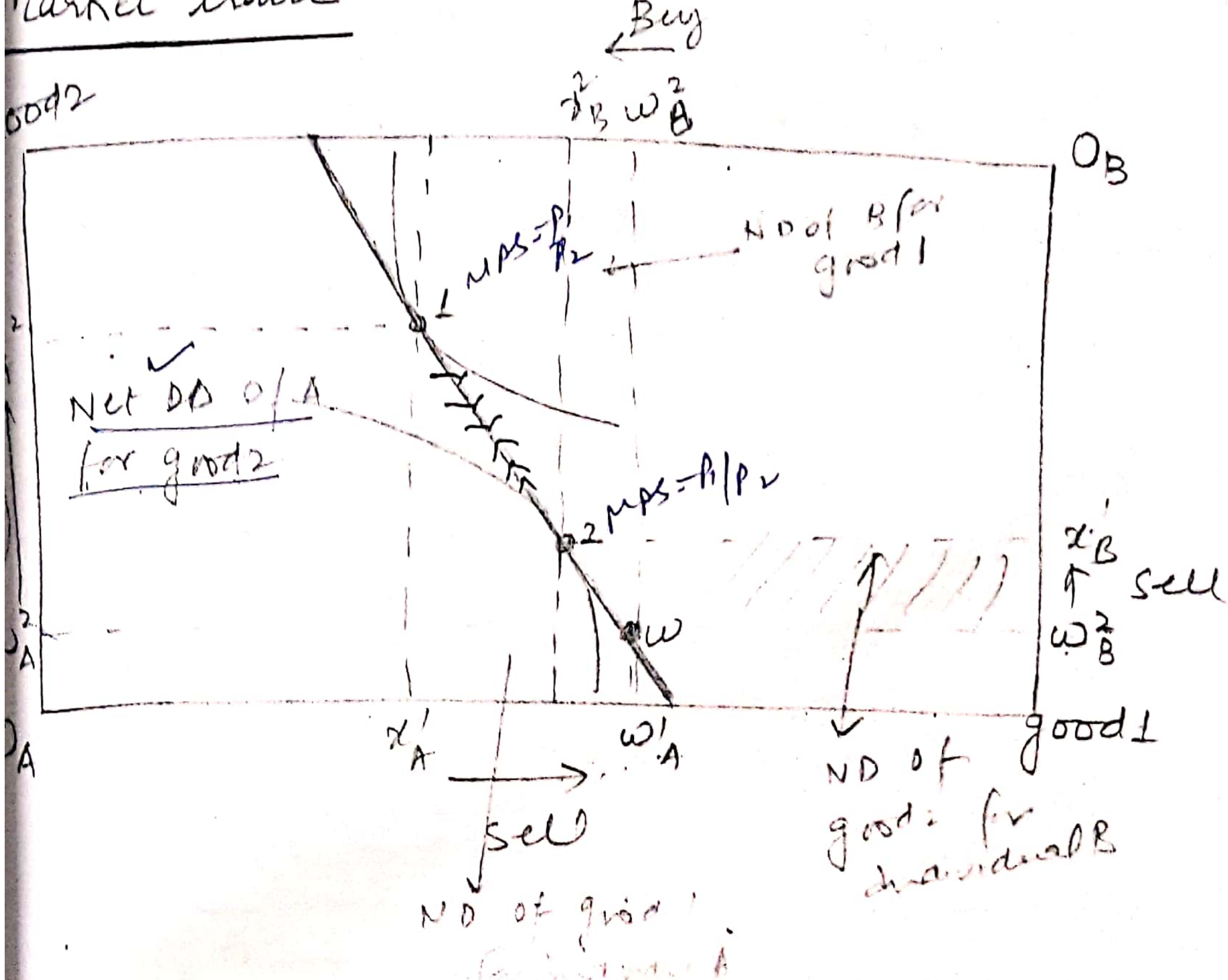
Market Trade



Slope of BC $= \frac{P_1}{P_2}$ $\Rightarrow$ DD ≠ SS

$P_2 \uparrow$ – flatter
$P_1 \uparrow$ – steeper

$\boxed{\text{good2}}$
$D > S \Rightarrow P_2 \uparrow$
$\boxed{\text{good 1}}$
$S > D \Rightarrow P_1 \downarrow$

tangency of IC above w

Total Expenditure = Total Income

$P_1 x_A^1 + P_2 x_A^2 = P_1 w_A^1 + P_2 w_A^2$

$MRS_A = \frac{P_1}{P_2}$
$MRS_B = \frac{P_1}{P_2}$
for Pareto efficiency $MRS_A = MRS_B$

Gross Demand or Demand

$(x_A^1, x_A^2) \Rightarrow$ for Individual A

$(x_B^1, x_B^2) \Rightarrow$ for Individual B

Net Demand | Excess Demand

$\Rightarrow e_A^1 = |x_A^1 - w_A^1|$
>0] Buying
<0] selling

[$|w_A^1 - x_A^1|$
>0] selling
<0] Buying]

at Prices (P_1, P_2)

1) Good 1

$x_A^1 \longleftarrow w_A^1$

distance $\Rightarrow$ net demand of A for good 1

[so for good 1 as well as for good 2
Demand is not equal to supply]

[excess demand in good 2 market
excess supply in good 1 market]

So prices are adjusting in such a way that
1 and 2 Becomes a single equilibrium

$(P_1, P_2) \longrightarrow (P_1^*, P_2^*)$ at equilibrium

At (P_1, P_2)

for good 1

A's net demand for good 1 > B's net demand for good 1

Sell ES

Buy DD

$\Rightarrow |w_A^1 - x_A^1| > |x_B^1 - w_B^1|$

$\Rightarrow \boxed{e_A^1 > e_B^1}$ sell $\Rightarrow P_1 \downarrow$

(4) w_A^1 x_A^1 e_A^1

(4) w_A^2 x_A^2 e_A^2

(4) w_B^1 x_B^1 e_B^1

w_B^2 x_B^2 e_B^2

(2) $z^1 = e_A^1 + e_B^1$

$z^2 = e_A^2 + e_B^2$

Z (1)

for good 2

A's net demand for good 2 > B's net demand for good 2

Buy

Sell

$\Rightarrow |x_A^2 - w_A^2| > |w_B^2 - x_B^2|$

$\Rightarrow \boxed{e_A^2 > e_B^2}$ Buy $\Rightarrow P_2 \downarrow$

$\left(\frac{P_1 \downarrow}{P_2 \uparrow}\right) \downarrow$

$\Rightarrow$ flatter BL

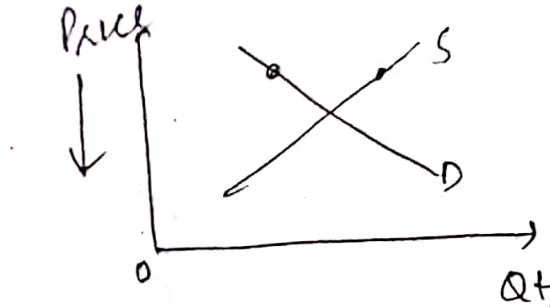
Note)

Prices i.e arbitrary price (P_1, P_2) does not guarantee that total supply will equate total demand for each good

(i.e) $e_A^1 = e_B^1$ or $e_A^2 = e_B^2$] not necessary $\Rightarrow$ adjust given

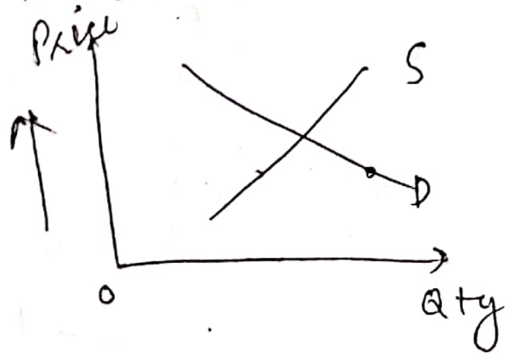
Total amount of each good they want to hold may not be equal to the amount available,

here economy is in disequilibrium so, prices of good 1 and good 2 (P_1, P_2) will adjust so as to restore equilibrium in good 1 and good 2 market if ∃ [there exist] excess supply in general



(P↓)

if ∃ excess demand in general



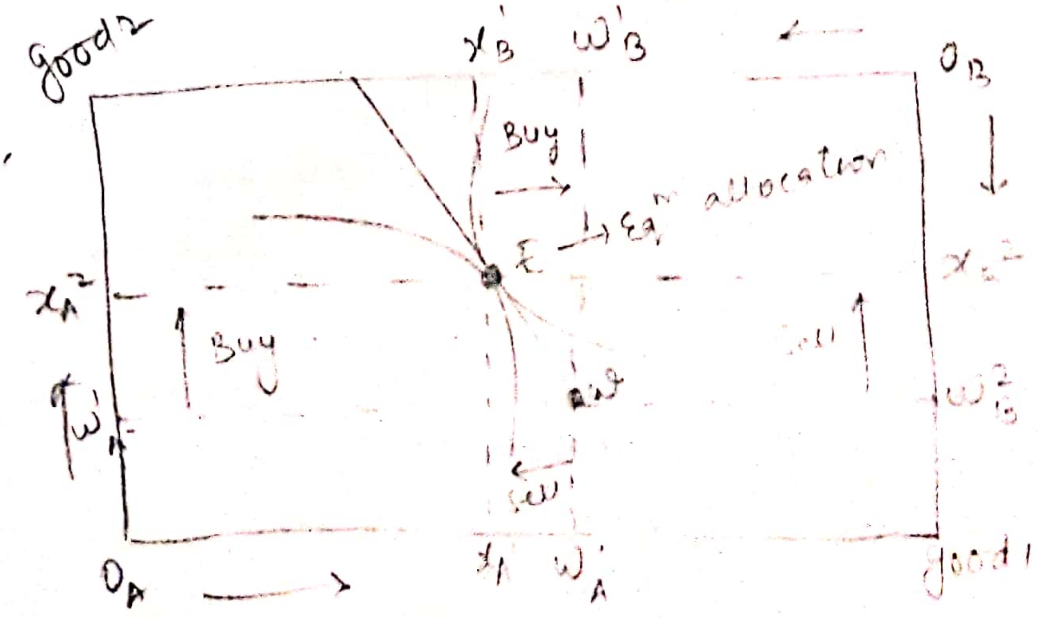
(P↑)

In this case $P_2 \uparrow$ and $P_1 \downarrow$

i.e $\left(\frac{P_1 \downarrow}{P_2 \uparrow}\right) \downarrow$

here Budget line will become flatter until net demand in each market for individuals A & B equate each other

i.e $\boxed{e_A^1 = e_B^1}$ $\boxed{e_A^2 = e_B^2}$



pt E is Pareto Efficiency allocation

in above diagrame

$$\boxed{e'_A = e'_B}$$ at Prices (P_1^* and P_2^*)

$$e_A^2 = e_B^2$$ at Prices (P_1^*, P_2^*)

[$MRS_A = MRS_B$
at same point technically]

hence, total demand is equal to total supply in each market

Imp

ere; market is in equilibrium. point E is called market equilibrium, Competitive equilibrium or walrasian equilibrium.

here each individual choses most prefered Bundle and there choice exhaust available supply.

i.e demand = Supply, in each market for each good

In diagrame:

1) for each individual:
IC is tangent to Budget line

2) $MRS_A = \frac{P_1^*}{P_2^*}$] $MRS_A = MRS_B$
$MRS_B = \frac{P_1^*}{P_2^*}$] at point E (unique point E)

3) Two IC's are tangent to each other.

for disequilibrium (read carefully)

$MRS_A = \frac{P_1}{P_2}$ at pt E_A] $MRS_B = \frac{P_1}{P_2}$ at pt E_B.) Note ~~Learn~~

f) Total Demand is equals to total supply

Demand

$$x_A^1 + x_B^1 = \omega_A^1 + \omega_B^1$$
$$x_A^2 + x_B^2 = \omega_A^2 + \omega_B^2$$

Supply ✓

Algebric Equation :

Let

$x_A^1(P_1, P_2)$ – A's Gross demand for good 1
$x_B^1(P_1, P_2)$ – B's demand for good 1

$x_A^2(P_1, P_2)$ – A's demand for good 2
$x_B^2(P_1, P_2)$ – B's demand for good 2

Equilibrium is a set of prices (P_1^*, P_2^*) where
-) Demand = Supply of good 1
i.e

$$x_A^1(P_1^*, P_2^*) + x_B^1(P_1^*, P_2^*) = \omega_A^1 + \omega_B^1$$

Gross Demand

and

$$x_A^2(P_1^*, P_2^*) + x_B^2(P_1^*, P_2^*) = \omega_A^2 + \omega_B^2$$

Gross Demand

$$[x_A^1(P_1^*, P_2^*) - \omega_A^1] + [x_B^1(P_1^*, P_2^*) - \omega_B^1] = 0$$

$$[x_A^2(P_1^*, P_2^*) - \omega_A^2] + [x_B^2(P_1^*, P_2^*) - \omega_B^2] = 0$$

net / Excess demand

These equation say that ~~sum~~ of net Demand for each agent for each good should be equal to zero, holding on equilibrium price

$$\left(\begin{array}{c}\text{net amount A}\\ \text{choose to dd or SS}\end{array}\right) = \left(\begin{array}{c}\text{net amount B}\\ \text{choose to SS or DD}\end{array}\right)$$

Scanned with CamScanner

in general, at any arbitary price (P_1, P_2)

net dd for good is

$$e_A^1 = x_A^1(P_1, P_2) - w_A^1$$
$$e_B^1 = x_B^1(P_1, P_2) - w_B^1$$

ow, aggregate excess demand for good 1 is denoted by $Z(P_1, P_2)$

$$Z_1(P_1, P_2) = e_A^1(P_1, P_2) + e_B^1(P_1, P_2) \text{ — good 1}$$
$$\Rightarrow [x_A^1(P_1, P_2) - w_A^1] + [x_B^1(P_1, P_2) - w_B^1] = 0$$

only at eqm prices

$$Z_2(P_1, P_2) = e_A^2(P_1, P_2) + e_B^2(P_1, P_2) \text{ — good 2}$$
$$\Rightarrow [x_A^2(P_1, P_2) - w_A^2] + [x_B^2(P_1, P_2) - w_B^2]$$

at Equilibrium (P_1^*, P_2^*), aggregate excess demand for each good is zero.

i.e. $Z_1(P_1^*, P_2^*) = 0$

& $Z_2(P_1^*, P_2^*) = 0$

it turns out that if aggregate excess demand for good 1 is zero, then aggregate excess demand for good 2 must necessarily be zero.

th Jan, 16

Walras' law

it state that

$$\underbrace{P_1 Z_1(P_1, P_2)}_{\text{value aggregate excess dd for good 1}} + \underbrace{P_2 \cdot Z_2(P_1, P_2)}_{\text{value of aggregate excess dd for good 2}} \equiv 0$$

value of aggregate excess demand is identically zero (By defination it is zero)

The value of aggregate demand is identically zero means that, it is zero for all possible choices of price and not just equilibrium prices.

$$\left[\begin{array}{l} Z_1(P_1^*, P_2^*) = 0 \\ Z_2(P_1^*, P_2^*) = 0 \end{array}\right]$$

but here

$$\underbrace{P_1 Z_1(P_1, P_2) + P_2 Z_2(P_1, P_2) = 0}_{\text{value of Aggregate dd for all prices}}$$

Note 1)

aggregate excess demand is equal to zero at only equilibrium price

Note 2)

value of aggregate excess demand is equal to zero for all prices.

Proof.

Consider Budget constraint for Individual A

expenditure = income

$$\Rightarrow P_1 x_A^1(P_1, P_2) + P_2 x_A^2(P_1, P_2) \equiv P_1 w_A^1 + P_2 w_A^2$$

$$\Rightarrow P_1 [\underbrace{x_A^1(P_1, P_2) - w_A^1}_{e_A^1}] + P_2 [\underbrace{x_A^2(P_1, P_2) - w_A^2}_{e_A^2}] \equiv 0$$

$$P_1 e_A^1 + P_2 e_B^2 \equiv 0$$

$$\Rightarrow P_1 e_A^1(P_1, P_2) + P_2 e_A^2(P_1, P_2) \equiv 0 \quad \text{—— (1)}$$

it is important to write (P_1, P_2)

Similarly for Individual B

$$P_1 e_B^1(P_1, P_2) + P_2 e_B^2(P_1, P_2) \equiv 0 \quad \text{—— (2)}$$

value of A and B's net demand ... equal to zero
i.e. value of [illegible] purchases is equal to value to sells

Note)
one of the excess demand is negative

Adding eq (1) & (2)

$$P_1 e_A^1(P_1,P_2) + P_2 e_A^2(P_1,P_2) + P_1 e_B^1(P_1,P_2) + P_2 e_B^2(P_1,P_2) \equiv 0$$

$$P_1[e_A^1(P_1,P_2) + e_B^1(P_1,P_2)] + P_2[e_A^2(P_1,P_2) + e_B^2(P_1,P_2)] \equiv 0$$

$$P_1 Z_1 + P_2 Z_2 \equiv 0$$

$$\boxed{P_1 Z_1(P_1,P_2) + P_2 Z_2(P_1,P_2) \equiv 0}$$

Hence proved

... value of each agents excess demand equals to zero

... value of sum of agents' excess demands must equals zero [at arbitrary price]

... figure:

... one market clears at a particular set of prices then other market must necessarilly be in equilibrium [consider only two economy] mkt in

... walras law identity holds for all prices then it must hold for a set of prices where excess demand for good 1 is zero

$$x_A^1 + x_B^1 = w_A^1 + w_B^1 \quad \text{— market for good 1 clears}$$

$$(x_A^1 - w_A^1) + (x_B^1 - w_B^1) = 0$$

$$e_A^1 + e_B^1 = 0$$

$$Z_1 = 0 \text{ — at } P(P_1^*, P_2^*)$$

Scanned with CamScanner

from walras law we write down

$$\underbrace{P_1^* \cdot Z_1(P_1^*, P_2^*)}_{zero} + P_2 Z_2(P_1^*, P_2^*) = 0$$

if $P_2 > 0$

$\therefore$ for making $eq^n = 0$ we need to $Z_2(P_1^*, P_2^*)$ equals to zero

i.e if we find a set of prices (P_1^*, P_2^*) where demand for good 1 equals supply of good 1, we guarantee that demand for good 2 must equal supply of good 2

if we have markets for k goods, we only need to find set of prices where (k-1) markets are in equilibrium and walras law implies that market for good k will be automatically have dd equals to s

$$(\underbrace{P_1^*, P_2^*, P_3^* \ldots P_{k-1}^*}_{\text{are in equilibrium}}, P_k^*)$$

- (k-1) in eqm

not necessary that start with starting

$$1, \underbrace{2, 3 \ldots k-1, k}_{eqm}$$

$$\underbrace{1, 2, 3, \ldots k-1}_{eqm}, k$$

$$P_1^* Z_1^* + P_2^* Z_2^* + P_3^* Z_3^* + \ldots P_{k-1}^* Z_{k-1}^* + P_k^* Z_k^*$$

$Z_1^* = 0$

$Z_2^* = 0 \qquad Z_{k-1}^* = 0$

$P_k^* > 0$

then Z_k^* must be zero.